

Virginia Department of Environmental Quality

Electronic Waste (eWaste) Management Activities

DEQ eWaste
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eCycling and eWaste Management

In the past few years the complex issue of dealing with end-of-life electronics (computers, televisions, copiers, faxes, and video/audio equipment) and the concerns about the potentially hazardous nature of this material has created a whirlwind of discussion and controversy. Disposal bans have been proposed and in some cases implemented, and in response a number of firms have staked their position as recyclers and processors of this material. There is a definable network of collectors and processors for the eWaste material, and the network is growing, but the paramount question is who pays the bill for electronics recycling (eCycling)?

Why the concern about eWaste? EPA provides the following information on its web site:

Why Recycle Electronics?

- *Electronics are a fast growing portion of America's trash* - with 250 million computers destined to become obsolete by 2005.
- *Electronics are made with valuable materials.* In 1998, over 112 million pounds of materials were recovered from electronics including steel, glass, plastic, and precious metals.
- *Plus, electronics can present an environmental hazard if they are disposed of improperly.* With an average of four pounds of lead in many older TV picture tubes or computer monitors, along with other potentially hazardous materials, electronics call for special handling at the end of their lives.

In response to the concerns about the improper handling and disposal of electronics (eWaste), EPA has proposed an Universal Waste exemption for electronics not handled as waste but handled as a commodity for de-manufacturing, refurbishment or component recycling as a means of promoting the non-disposal options for this material. Virginia has incorporated this proposed exemption in matters dealing with electronics recycling facilities and issues. In addition, EPA has developed a number of initiatives to promote the recycling of these products: EPA Region III's eCycling Project, Plug Into E-Cycling, the National Electronic Product Stewardship (NEPSI) dialogue, the Federal Electronics Challenge, and the Resource Conservation Challenge. In the meantime a number of organizations and groups have lobbied to require that the electronics equipment manufacturers become more responsible for both the toxicity of their products (green manufacturing and design for recycling) as well as the end-of-life processing needs for their products.

Virginia was a partner in the EPA Region III eCycling pilot along with Maryland, Delaware, West Virginia, Pennsylvania, and Washington, D.C. This project, funded by EPA and the Electronics Industry Association, required each state to set up a number of electronics collection events to determine which collection model best served the interests of the localities served. Virginia hosted 5 collection events (Virginia Beach, Richmond, Frederick County, Wise County, and Charlottesville) and collected data from the participants. Over the two-year life of the project approximately 100 tons of eWaste were diverted to recycling alternatives. This project provided the impetus for the startup of a number of permanent electronics collection programs across the state: weekly/monthly collections in Alexandria, Frederick County, and Prince William County; spring/fall collections in Arlington and Falls Church. The program spurred a number of one-time events in Wise County, Manassas, Newport News, Virginia Beach, Montgomery County, Charlottesville and Loudoun County.

During the eCycling events, citizens were surveyed on their participation in the event. Questions included: 1) who do you think should pay for the safe recycling of electronic products? (consumer/user, retail store, electronics manufacturer, government, or other); 2) what would be the most you would be willing to pay per item to recycle your electronics? (\$2, \$5, \$10); and, 3) what is the most convenient way for you to recycle your electronics? (municipal recycling center, retail store, mail back to manufacturer, donation, or other). The results of the survey: 1) 60% were willing to pay \$2, 25% would pay \$5, and only 11% would pay \$10 per unit; 2) 34% felt that both the consumer and the manufacturer should pay, while only 20% felt that the government should pay; and, 3) 74% felt that the municipal recycling center was the most convenient, while all the others were less convenient.

As with any recyclable commodity, citizens appear to want the government to provide convenient and low-cost/no-cost recycling of electronics. In the eCycling project, citizens were either allowed to bring their electronics in at no-cost, or in some cases, were charged for specific electronic pieces (CRTs, TVs). This second collection option, i.e., individual item specific fees, has been adopted by several of the collection programs in Virginia. Frederick County charges the same fee to citizens that its contractor charges it (CRTs at \$8 each, TVs from \$12 to \$20 each). Falls Church charges variable rates for CRTs (\$7 and up) and TVs (\$9 and up) dependent on screen size, again a factor of the charges by its contractor. Montgomery County also used a variable fee for its one-time collection. By placing the direct cost for handling these specific units on the citizen bringing in the material, the localities' program costs are greatly reduced while providing an electronics recycling opportunity for the community.

The eCycling Project collection, processing and transportation costs were approximately \$1.1 million dollars for the management of 5.5 million pounds of electronics, or an average cost of \$0.20 per pound. From the eCycling data submitted, Virginia's total average cost, including locality expenditures for advertising, staffing of the events and other costs, was \$0.95 per pound. A calculation of the overall costs to the Central Virginia Waste Management Authority's collection event shows a similar picture: approximately 23 tons of electronics were collected, and total expenditures for the event were \$32,970. This calculates out to a cost of \$0.72 per pound. This doesn't sound too high a cost until you translate this per pound cost to a per ton cost: eCycling Project at \$0.20 per pound is \$400 per ton; Virginia at \$0.95 per pound is \$1,900 per ton; and

CVWMA at \$0.72 per pound is \$1,440 per ton. Compare these costs to those of landfilling the material and the problem becomes evident.

The NEPSI project was an EPA sponsored program to bring the stakeholders for electronics together to discuss and to develop a working system for the recovery of electronics within a sustainable and cost-effective network. Although all members of NEPSI acknowledge the need to collect and recycle the electronic materials, how to pay for the process has thus far been difficult to agree on. Proposed cost recovery scenarios have included an end-of-life fee collected at the point-of-disposal/return, an advanced recycling fee collected at the point-of-sale, an advanced recycling fee included in the manufacturer's pricing, or various hybrids of these. Included in the discussions were the following topics: manufacturers should set up take-back programs for their specific models at no or reduced cost to the consumer; retailers should set up take-back programs for all electronics they sell at no or reduced cost to the consumer; or, government should place levy a recycling fee on all electronics sold in their jurisdictions to be used to cover the costs of its eCycling programs.

Ultimately the consumer will pay for the recovery and recycling of electronics through fees or taxes. The real questions are: 1) At what stage of the product's life will the cost be paid? 2) How can the current costs of such recovery/recycling be reduced to stimulate consumer participation and the set up of collection programs by localities? 3) What can manufacturers do to produce a product that is more easily recycled and also less toxic to the environment? and, 4) What can government and business do to increase the recycling options for electronics?

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